Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands	)	WT Docket No. 02-353
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COMMENTS OF NOKIA INC.

Nokia Inc. ("Nokia") hereby submits comments in response to the Federal Communications Commission's ("Commission") Notice of Proposed Rulemaking ("NPRM") in the above captioned proceeding on matter of service rules to be established for advanced wireless services in the 1710-1755 MHz and 2110-2155 MHz bands. Nokia is a global company with 54,000 employees worldwide with key growth areas in wireless and wireline communications. A pioneer in mobile telephony, Nokia is the world's leading mobile phone supplier and a top supplier of mobile, fixed and IP networks, as well as related services.

Technical Rules

Nokia by and large supports the technical rules proposed in this NPRM. For example, Nokia generally agrees with the concept of flexible use as a market-oriented approach that could facilitate more efficient use of spectrum. However, flexibility – as much as overly rigid policies – should have its limits. Some general roadmap is needed to provide the regulatory certainty, particularly on general service categories and technical parameters such as those governing interference, needed for manufacturers and operators to invest in a new service.

With respect to band plans, Nokia believes that the best use of this spectrum would be accomplished by assigning the lower frequencies (1710-1755 MHz) for mobile transmit and the upper frequencies (2110-2155 MHz) for base transmit. This assignment makes the most sense in terms of both technical considerations and global spectrum harmonization and for this reason was recommended by ITU-R Working Party 8F ("ITU-R WP8F") in ITU-R M.1036, the draft recommendation on "Frequency Arrangements for Implementation of International Mobile Telecommunications-2000 (IMT-2000) in the Bands 806-960 MHz, 1710-2025 MHz, 2110-2200 MHz and 2500-2690 MHz", Doc. 8F/TEMP/330r2 ("ITU-R M.1036").

The mobile and base transmitters should be separated to avoid severe interference. If the Commission were to permit the use of both base and mobile transmitters in both bands, one option raised in the NPRM[1], interference would occur between base stations, as well as between mobile stations. As with any paired spectrum system, some frequency separation between uplink and downlink is required to prevent harmful interference.

Likewise, Nokia strongly recommends against establishing technical rules for these bands that would encourage both TDD and FDD use in these bands. Even with the introduction of tighter RF filtering requirements,

[1] Federal Communications Commission, *Notice of Proposed Rulemaking in the Matter of Service Rules for Advanced Wireless Services in the 1.7 and 2.1 GHz Bands (WT Docket No. 02-353)*, paragraphs 66-67.

interference caused by TDD and FDD co-existence would be severe. The studies regarding TDD and FDD co-existence are either still ongoing or show a need to introduce large guardbands between TDD and FDD to mitigate interference[2]. Introduction of large guardbands would be an inefficient use of spectrum, wasting valuable mobile frequencies below 3GHz. Additionally, introduction of TDD in these bands would require significant and complex re-engineering for all systems in the band.

TDD use in the bands 1710-1755 MHz and 2110-2155 MHz limits the benefits of global spectrum harmonization in these bands by introducing a frequency arrangement that will be unique on an international basis. ITU-R M.1036 only recommends FDD in the 1.7 GHz and 2.1GHz bands and in fact, recommends they be used for uplink and downlink, respectively, in Option B6 of ITU-R M.1036. The 2110-2170 MHz band is already identified and being used for downlink in IMT-2000 networks in several countries[3] that elected to allocate the bands 1920-1980 MHz (for mobile transmit) and 2110-2170 MHz (for base transmit) identified for IMT-2000 at the World Radiocommunications Conference-1992 ("WARC-92"). To introduce TDD into the 2110-2170 MHz band would create a unique frequency arrangement, rather than take advantage of the benefits of global harmonization of this upper band. The Commission should seek to maximize global spectrum harmonization, particularly in spectrum such as 2110-2170 MHz where this is possible. Global spectrum harmonization provides benefits to consumers, manufacturers and operators by creating economies of scale that allow more affordable equipment with greater variety, while facilitating global roaming.

Spectrum Blocks and Pairing

The Commission seeks information on the amount of spectrum that should be included in each license and whether those blocks should be paired.[4] With respect to the amount of spectrum that should be included in each license, Nokia believes that there are two primary options that should be considered:

- Three licenses of 2x15 MHz of contiguous paired spectrum enabling three operators, or
- Three licenses of 2x10 MHz of contiguous paired spectrum and one license of 2x15MHz of contiguous paired spectrum, enabling four operators.

In choosing among these options the Commission must weigh the benefits of each option. The first option is sufficiently wide to adequately support hierarchical cell layers and the full range of high bit-rate services envisioned for advanced wireless services. The second option creates a more competitive market with the addition of a fourth operator.

Nokia believes that the spectrum included in each license should be paired and symmetrical. The spectrum at 1710-1755 MHz and 2110-2155 MHz is already ideally suited for symmetrical pairing and is a recommended frequency arrangement, Option B6, in ITU-R M.1036. To introduce unpaired spectrum would add unneeded

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[2] ITU-R 8Working Party 8F, *"Draft New Report ITU-R M.[IMT.COEXT] on the coexistence between IMT-2000 TDD and FDD radio interface technologies operating in adjacent bands and in the same geographical area"* (Doc. 8F/TEMP/232r1e)

[3] According to the UMTS Forum, more than 112 IMT-2000 licenses for "WARC-92" bands have been granted in most of Europe and many countries in Asia-Pacific (including Australia, Hong Kong, Japan, Korea, New Zealand, and Singapore) by November 2002.

[4] Federal Communications Commission, *Notice of Proposed Rulemaking in the Matter of Service Rules for Advanced Wireless Services in the 1.7 and 2.1 GHz Bands (WT Docket No. 02-353*, Paragraph 26.

complexity to this band without any clear benefits. At this current time, symmetrical operations and services are expected to be the "norm" and the spectrum allocation should reflect this reality. In the future, however, asymmetrical uses may increase with more downlink spectrum needed than uplink.